

NEW SPECIES OF POTAMOGETON, WITH NOTES UPON SOME PUBLISHED FORMS.—Owing to the difficulty of obtaining specimens of certain European species in fruit which are needed for comparison and safe determination, the writer has been unable hitherto to complete the promised revision of the North American species of *Potamogeton*. The following notes are published in advance in the hope that they may prove of service to collecting botanists during the coming season, and for the purpose of soliciting further specimens. The determinations of new species here offered are not regarded as final.

*P. ILLINOENSIS*.—Stem stout, branching towards the summit; floating leaves opposite, thick, coriaceous, oval or ovate, 2–3 inches long by  $1\frac{1}{2}$  broad, 19–23 nerved, rounded or sub-cordate at base, and with a short blunt point at the apex, on short petioles: submerged leaves comparatively few, dark green, oblong-elliptical, acute at each end, usually ample (the largest nearly 8 inches long and  $1\frac{1}{2}$  wide), entire, rarely mucronate, nearly or quite sessile, the uppermost opposite; stipules coarse, free, obtuse, strongly bicarinate, about 2 inches in length; peduncles often clustered at the summit of the stem, 2–4 inches long, usually somewhat thickening upwards; spikes about 2 inches long, densely flowered; fruit roundish obovate,  $1\frac{3}{4}$ –2 lines long and  $1$ – $1\frac{1}{2}$  lines wide, 3-keeled on the back, the middle keel prominent and sometimes shouldered at the top, flattened and slightly impressed on the sides, obtuse or occasionally pointed at the base, the style short and nearly facial, the apex of the embryo pointing transversely inwards.

Allied to *P. lucens*, L., in habit, but with larger fruit, and in foliage quite distinct. It was first discovered by Mr. H. N. Patterson in the Mississippi River bottoms, near Oquawka, Ill. Apparently the same is also sent by Rev. E. J. Hill, collected in ditches at Englewood, Ill., but his specimens approach the *lucens* type more nearly, having very large oval, shining upper submerged leaves, which (as also the floating) are 23–38 nerved.

*P. MYSTICUS*.—The whole plant very slender; stems irregularly branching, from a creeping rootstock, nearly filiform, terete, 1–3 feet high; leaves all submerged, scattered, entire, oblong-linear,  $\frac{1}{2}$ – $1\frac{1}{2}$  inches long and 2 or 3 lines wide, 5–7 nerved, finely undulate, obtuse or bluntly pointed at the apex, abruptly narrowing at the base, and sessile or partly clasping; stipules free, obtuse, about 6 lines long, mostly deciduous but often persistent and closely sheathing the stem; spikes few, capitate, 4–6 flowered, on erect peduncles from 1 to 2 inches in length. Fruit fully matured not seen, but one or two rather immature specimens indicate that it is obovate, minute, scarcely  $\frac{3}{4}$  of a line long by  $\frac{1}{2}$  a line broad, obscurely 3-keeled on the back, a little beaked by the slender, recurved style.

With the habit of *P. perfoliatus*, but scarcely one-third as stout in any of its parts.—Aug., Sept. Mystic Pond, Medford, Mass., the sheet of water in which the early American investigators of this genus found so many of their plants. The author was not aware that

any one but himself had ever detected this form until he was recently shown unnamed specimens in the herbarium at Cambridge, collected a few years since by Wm. Boott, Esq., of Boston.

*P. LATERALIS*.—Stem filiform, branching; floating leaves elliptical, 4–6 lines long and 2 wide, with 5–7 nerves deeply impressed beneath, tapering at the base into a somewhat dilated petiole shorter than the blade; submerged leaves linear, acute, 1–3 inches in length and  $\frac{1}{4}$ – $\frac{1}{2}$  line wide, 1–3 nerved, the lateral nerves often obscure, the mid-nerve large and often with fine veins or cellular reticulations on each side, biglandular at base as in *P. pusillus*, but the glands few and small and often obsolete; stipules free, short, obtuse when young; peduncles with a very peculiar lateral appearance, (as is also the case with the floating leaves,) widely spreading at maturity, sometimes even recurved,  $\frac{1}{2}$ –2 inches long, often thicker than the stem; spikes commonly interrupted, 2–4 flowered; fruit obliquely obovate, scarcely a line long by  $\frac{3}{4}$  of a line broad, the back much curved, obtuse, with two fine grooves upon it, face slightly arched and surmounted by the nearly sessile stigma, the embryo oval in its curve, the apex nearly touching the base.

This plant has been rarely found, and specimens of it not fully developed have been referred to *P. pusillus*, with which it is allied, but Mr. C. E. Faxon discovered it the last season at Dedham, Mass., with abundant floating leaves and good fruit which seem to establish its claim to a specific rank.

*P. PUSILLUS*, L., var. *POLYPHYLLUS*.—A dwarf form, 3–5 inches high, divaricately branching from the base, and very leafy throughout; leaves very obtuse, not cuspidate, 3-nerved; non-flowering but abundantly provided with propagating buds which are formed on the thickened and hardened ends of the branches, and closely invested by imbricated leaves.

Sept. — In a shallow pool, with oozy bottom, some distance under water, at South Natick, Mass.

*P. GEMMIPARUS*, Robbins in herb. — Stem filiform, branching, terete, greatly varying in height, rising from 1 to 4 feet according to the depth of the water in which it grows; the internodes below, especially in deep water forms, often five inches long; leaves hair like, some times not as broad as the stem, often with no perceptible midrib, plane or canaliculate above, and tapering to the finest point, 1–3 inches long, biglandular at base; stipules  $\frac{1}{2}$ –1 inch in length, acute or obtuse, mostly deciduous; spikes few, interrupted, 3–6 flowered, on long, filiform peduncles; fruit very rare, and like that of *P. pusillus*, except that it is flatter and somewhat impressed on the sides; commonly propagated by gemmæ, which are abundant. The leaves and stems are often alike in size, so that the plant seems to consist of threads, and this, with the long, naked internodes, renders its appearance very peculiar.

*P. pusillus*, L., var., *gemmaiparus*, Robbins, in Gray's Man., Ed. 5.

The mature fruit of this rare species was obtained at Amherst,

Mass., by Rev. H. G. Jesup, in 1874, and by him sent to Dr. Robbins, who thereupon substituted the name here given.

Aug., Sept. Slow moving streams and still water in various parts of New England:

*P. NIAGARENSIS*, Tuckerman.—Intermediate forms between this and *P. pauciflorus*, Pursh, have been found within a few years past, rendering it doubtful whether its old rank in Ed. 4, Gray's Man., as a variety of *pauciflorus*, should not be restored. The writer collected specimens in sluggish creeks and pools near the mouth of the river Niagara which have the foliage of *pauciflorus* and the fruit of *Niagarensis*. Rev. E. J. Hill has found an equally doubtful form in great abundance at South Chicago, Ill., and the same comes from Canada. A larger number of specimens, and a closer examination may make it necessary to unite the two under the older name.

*P. PECTINATUS*, L.—Particular attention is called to this species, as quite a number of abnormal forms have been discovered since the issue of Dr. Robbins' monograph, especially in the regions west of the Mississippi, and some of these may prove to be distinct species. It is hoped that additional specimens and notes from botanists in the field will render a good definition possible.

*P. ZOSTERACEUS*, Fries. —Similar in general appearance to *P. pectinatus*, but stouter; leaves flat, 1–3 inches long by 1–2½ lines broad, 3–5 nerved, with many cross veinlets, amplexicaul, obtuse or acute; stipules adnate to the base of the leaves, obtuse, shorter and narrower than the striate, scarious-margined sheaths; peduncles slender, 1–4 inches long; flowers in verticils more or less distant; fruit agreeing with that of *pectinatus* in size and shape, but rather more flattened, the style long and recurved, and the apex of the embryo pointing transversely inwards

California. *P. pectinatus*, var.? *latifolius*, Robbins in Bot. King's, Ex. 338. As figured by Reichenbach, this species has drooping peduncles 8 inches in length, with verticils of fruit 1½ inches distant, but the writer has authentic European specimens which agree with our form in every particular.

*P. MARINUS*, L.—Low (3–6 inches) and leafy, with many dichotomous branches; leaves all submerged, thick, setaceous, 1 nerved, with a few transverse veinlets, obtuse or acute, 2–4 inches long; stipules adnate to the base of the leaves, shorter than the sheaths which have narrow, scarious margins, sometimes white; peduncles 2–3 inches in length; spikes interrupted or in approximate verticils, fruit subglobose obovate, 1–1½ lines long and ¾ to 1 line wide, obtuse on the margins, crowned with a broad sessile stigma, the embryo circle incomplete and the apex pointing to the base, usually corrugated when dry.

The European form differs only in having peduncles 3–6 inches in length.

Aug. (*P. filiformis*, Nolte). By some good botanists reckoned as a variety of *P. pectinatus*, but the fruit is clearly distinct.

The writer found this plant a few years ago growing on moss-covered rocks, in shallow rapids at Street's Island above Niagara Falls. It doubtless occurs in other localities in this country, but has probably been confounded with *P. pectinatus*, from some forms of which it can be distinguished only by the fruit.

Apparently a new and somewhat striking variety of *P. zosteræfolius*, Schum., (*P. compressus*, Gray's Man., Ed. 5,) is sent by Rev. E. J. Hill, collected in stagnant pools at Ashtabula, Ohio. The leaves are narrower, shorter, and more acute than in the type. They are only 3-nerved, being entirely destitute of the many fine lines which are so characteristic of the leaves of this species.

Specimens of the above mentioned forms, and of other species, are respectfully solicited.—THOMAS MORONG, *Ashland; Mass.*

NOTULÆ EXIGUÆ.—Referring to Mr. Martindale's article on the germination of *Orobanche*, one may doubt if it follows from the account given that seeds do not require attachment in order to induce germination, or in order to continued growth. It is very doubtful if the seeds in this instance germinated in the pot, since last autumn. More probably they had germinated in the soil beforehand, perhaps had fed on clover-roots or on some congenial host, but had not risen above the soil, which takes place only when about to flower. In potting the Geraniums the clover may have been pulled out, but the plant, having accumulated organized material enough to complete its growth, did so in due time and occasion. It is not proved nor probable that it could have made its growth independently in the manner of a green plant.

On p. 40, last line, "Leen" probably stands for Leer's.

Miss Reynolds describes *Aster Carolinianus* as making a fine display on the Ochlawha river in Florida. Will she inform us whether the base of the long stem is suffruticose, as Walter and Michaux say.

About *Draba verna* and such plants, and whether they are to be termed biennials or annuals, a difficulty comes in, which shows how evanescent this distinction becomes. At the north, where all vegetation is for a long while arrested by winter, it is perhaps needful to consider fibrous-rooted plants which germinate late in autumn, and survive the winter to blossom and fruit in earliest spring, as biennials. But the same plants and others like them, when growing further south, and especially where the winter is moist and mild and the summer hot and dry, regularly germinate in autumn, and flower and seed in early spring. They are *winter annuals* (see Gray, Structural Botany, new ed. p. 31), plants that run their course in the cool half instead of the warm half of the year.

Pringsheim's Chlorophyll investigations, and the hypothetical conclusions drawn from them are having an unusual popularisation. It may be desirable to keep in mind that the conclusions do not follow from the premises.—A. G.